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Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been amended to further clarify Applicants disclosed and claimed invention and define over the prior art.

No new matter has been added.

For example, support for the amendments is found in the originally and previously presented claims, the Figures, and in Specification e.g.:

[0014] Another object of the present invention is to provide an embedded or recessed fastener technique which is suitable for mounting components in any type of process chamber including but not limited to a CVD, PVD, etching or ashing chamber.

Claim Rejections under 35 USC 103

1. Claims 1, 2, 21-28, and 31-34 stand rejected under 35 USC 103(a), as being unpatentable over Masuda et al. (US PUB 2002/0000197) in view of Ohta (US 4,526,132).

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Masuda et al. show a schematic representation of a showerhead 12 Figure 2 that is only described as "having small holes so that the raw material gas introduced into the gas storing chamber 18 passes through the small holes of the shower plate 12 and sprayed into the reactor chamber" (see paragraph 0088, 0111, 0121).

Masuda et al. nowhere suggests or discloses how the showerhead 12 is installed. Masuda et al. nowhere describes that the showerhead engages the chamber wall or if a confinement structure is used to direct the gas from the gas storage space 18 through the showerhead. In any event, assuming *arguendo* that **one may speculate from the schematic shown** in Masuda et al. that the **showerhead engages the chamber wall**, which Applicants do not concede, Masuda et al. nowhere suggests or discloses how the showerhead 12 is installed.

Masuda et al. nowhere recognize or suggest the problem that Applicants have recognized and solved by their disclosed and claimed invention:

"An apparatus to reduce particle contamination to a semiconductor device process chamber interior by thermal cycling

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of fasteners"

Or disclose or suggest:

"a plurality of exterior fasteners extending through and penetrating said chamber wall into in said showerhead"."

In contrast, Ohta discloses a discharger 37 mounted on a flange 39 (see Figure 2, 3 and 4) where holes 51 are provided so that a screwing bolt 52 can be screwed through the hole (col 3, lines 55-60; col 4; lines 12-23), i.e., the bolt 52 **does not extend through and penetrate the chamber wall (see Figures 3 and 4).**

i.e., **"Flange 39 is fixed to protrusion tube 30A of bell jar 30 by screwing bolt 52 into screw hole 51, so that opening 53 of protrusion tube 30A can be sealed. At this time, a sealing member such as rubber made O-ring 55 is fitted in a ring-shaped groove which is formed on the inner surface of flange 39, and thus protrusion tube 30a and flange 39 are fixedly joined to be airtight"** (see col 4, lines 12-19).

Thus, even assuming *arguendo*, a proper motivation modifying Masuda et al. based on the teachings of Ohta i.e.,, attaching the showerhead of Masuda et al. with the flange bolts and holes of Ohta (fixed to protrusion tube on the exterior of chamber wall not penetrating the chamber wall) would not produce Applicants

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invention.

Examiner argues that "it is well known in the art to attach one object to another by passing a fastener through the first object and into the second object. Thus the suggestion or motivation is found in the references themselves and in the general knowledge of one of ordinary skill in the art. Furthermore it has been held that applying a known technique to a known device ready for improvement to yield predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*). In this case it would have been obvious to use the screws of Ohta to attach the showerhead of Masuda et al."

Examiner misquotes and misinterprets any holding from *KSR International Co. v. Teleflex Inc.* ___ U.S. 2007

"Neither the enactment of §103 nor the analysis in *Graham* disturbed this Court's earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. For over a half century, the Court has held that a patent for a combination which only unites old elements with no change in their respective functions . . . obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men.. *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U. S. 147, 152 (1950). This is a principal reason for declining to allow patents for what is obvious. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable

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results."

The Court goes on to reaffirm that even if individual elements of a claim are shown to be old, the combination is not necessarily obvious:

"Finally, in *Sakraida v. AG Pro, Inc.*, 425 U. S. 273 (1976), the Court derived from the precedents the conclusion that when a patent simply arranges old elements with each performing the same function it had been known to perform, and yields no more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282."

"As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was..."

Rather, KSR International Co. was highly fact specific and did not change the accepted and applied case law as has been cited with approval in the MPEP:

In the years since the Court of Customs and Patent Appeals set forth the essence of the TSM test, the Court of Appeals no doubt has applied the test in accord with these principles in many cases. **There is no necessary inconsistency between the idea underlying the TSM test and the *Graham* analysis.** But when a court transforms the general principle into a rigid rule that limits the obviousness

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inquiry, as the Court of Appeals did here, it errs.

KSR provided convincing evidence that mounting a modular sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art. Its arguments, and the record, demonstrate that claim 4 of the Engelgau patent is obvious. In rejecting the District Court's rulings, the Court of Appeals analyzed the issue in a narrow, rigid manner inconsistent with §103 and our precedents. The judgment of the Court of Appeals is reversed, and the case remanded for further proceedings consistent with this opinion.

For example, Examiner has not shown in the prior art that Applicants invention involves a "known technique" applied to semiconductor device process chambers such as vapor deposition, ashing or etching chambers; rather the disclosure of Ohta demonstrates that such technique is not known since the mounting bolts of Ohta are specifically designed not to penetrate the chamber wall into the chamber interior which would make the sub-atmospheric processing chamber of Ohta **unworkable**. **The bolts of Ohta do not penetrate the chamber wall into a structure in the chamber interior.**

In addition, Examiner has not shown in the prior art any suggestion or expectation of success of such a technique, or any recognition of any expected improvement resulting therefrom or

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any evidence of predicable results. For example, it might be expected that that passing bolts to penetrate the chamber wall to attach a structure within in the process chamber would interfere with any processes including sub-atmospheric processes associated with vapor deposition, ashing or etching chambers **unworkable**.

Examiner has further failed to show in either reference a recognition of the problem, or a solution thereto, that Applicants have recognized and solved by their invention:

"An apparatus to reduce particle contamination to a semiconductor device process chamber interior by thermal cycling of fasteners"

Examiner has not shown any teaching or suggestion in the prior art to produce Applicants invention. Indeed Examiner has not shown anywhere in the prior art where fasteners extend through and penetrate a chamber wall and are embedded into any structure in the interior of a process chamber as claimed by Applicants.

Applicants respectfully request Examiner provide evidence that Applicants 'technique' of attaching structures interior to a process chamber by fasteners extending from the exterior of the

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chamber through and penetrating the chamber wall into the structure interior to the process chamber is "well known".

"**First**, there must be some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a **reasonable expectation of success**. **Finally**, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 486, 20 USPQ2d 1438 (Fed. Cir. 1991).

"A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc., Garlock, Inc.*, 721 F.2d, 1540, 220 USPQ 303 (Fed Cir. 1983), cert denied, 469 U.S. 851 (1984).

"Finally, when evaluating the scope of a claim, every limitation in the claim must be considered. Office personnel may not dissect a claimed invention into discrete elements and then

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evaluate the elements in isolation. Instead, the claim as a whole must be considered." See, e.g., *Diamond v. Diehr*, 450 U.S. at 188-189, 209 USPQ at 9.

"[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103." *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969).

2. Claims 3, 5, 29, 30, 35 and 36 stand rejected under 35 USC 103(a), as being unpatentable over Masuda et al. in view of Ohta, above, and further in view of Lilleland et al. (US 6,073,577).

Applicants reiterate the comments made above with respect to Masuda et al. in view of Ohta.

Even assuming *arguendo* a proper motivation for modifying the reaction chamber of Ohta based on the teachings of Lilleland et al., the fact that Lilleland et al. disclose a showerhead electrode (10) and one or more baffle plates (22) above the showerhead electrode (10) and a confinement ring (17) (Figure 1),

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and nowhere suggests or disclose how the showerhead electrode or showerhead electrode assembly is mounted in a process chamber, does not further help Examiner in producing Applicants invention.

In addition, it is noted that modifying Masuda et al. with the confinement ring of Lilleland et al. would ensure that the showerhead of Masuda et al. would not engage the reactor walls, as the confinement ring of Lilleland et al. or dielectric annular ring 18 (being exterior to the shower head 10) would engage the chamber walls (see col 2, lines 49-54) in the modified structure of Masuda et al., thus further ensuring that such modification does not produce Applicants invention.

"First, there must be some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a **reasonable expectation of success**. **Finally**, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

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A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc., Garlock, Inc.*, 721 F.2d, 1540, 220 USPQ 303 (Fed Cir. 1983), cert denied, 469 U.S. 851 (1984).

3. Claims 1, 2, 21-28, and 31-34 stand rejected under 35 USC 103(a), as being unpatentable over Masuda et al., above, in view of Graves (4,331,352) and Ohta, above.

Applicants reiterate the comments made above with respect to Masuda et al. and Ohta.

In non-analogous art, Graves discloses a structure for supporting and constraining opposed members of a heat exchange frame where high temperature portions of the **heat exchanger** are thermally isolated from the frame.

Examiner refers to Figure 5 where an unlabeled bolt on the manhole cover 30b is shown extending into the interior of manway flange 28b (see also Figure 2 which shows the unlabeled bolts on the periphery of the manhole cover. Note that the manhole cover 28B covers air ducts e.g., 24b (Figure 1) that form a portion of

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the core 12 of the heat exchanger (see col 3, lines 55-60; col 4, lines 46-55).

Examiner states that "Graves teaches a manhole cover 30b which is part of the chamber wall and a manway flange 28B which is interior to the manhole cover 30B. The manway flange 28B has a lateral surface that engages the inner surface of the manhole cover of the chamber wall, and a fastener physically separated from the chamber interior and prevents contamination of the chamber caused by thermal cycling of the fastener". Since the manhole covers air ducts e.g., 24b, it is not clear what chamber Examiner is referring to. The chamber cannot be both the air ducts e.g., 24b and the housing 32 of the heat exchanger, which nevertheless both are non-analogous art to a semiconductor device vapor deposition chamber, an ashing chamber and/or an etching chamber.

Examiner nowhere explains where Graves discloses:

"a plurality of exterior fasteners extending from an exterior of said process chamber through and penetrating said chamber wall"

Examiner argues that Graves is analogous art "since it is directed to the same problem of attaching an **interior part of an**

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apparatus to a chamber wall with a fastener". Examiner misstates the problem that Applicants invention has solved and further, Examiner has inconsistently identified the manway cover as part of a chamber wall to which the manway flange is attached, where the manway flange cannot be said to be interior to the chamber (where the 'chamber' must be the inside of the air duct e.g., 24b since the manhole cover covers the duct and Examiner has identified the manway cover as part of the 'chamber' wall. Despite internally inconsistent identification of what the "chamber' is in Gravers, nevertheless, Examiner is clearly mistaken that the heat exchanger of Graves is in the **same field of endeavor** as a process chamber "selected from the group consisting of a vapor deposition chamber, an ashing chamber and an etching chamber;" or addresses any problems that are commonly associated between a process chamber as Applicants claim and a heat exchanger.

2141.01(a) Analogous and Nonanalogous Art

TO RELY ON A REFERENCE UNDER 35 U.S.C. 103, IT MUST BE ANALOGOUS PRIOR ART

The examiner must determine what is "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also *In re Deminski*, 796 F.2d 436, 230 USPQ 313

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(Fed. Cir. 1986); *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, **logically would have commended itself to an inventor's attention in considering his problem.**"); and *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).

Nevertheless, modifying Masuda et al. with the bolts extending through the manhole cover 30b which covers air ducts (e.g., 24b) into a manway flange 28b (not interior to a chamber of which the manhole covers form a chamber wall i.e., air ducts) and where the bolts **do not penetrate a chamber wall into a structure interior to the chamber**, such modification does not produce Applicants invention.

"Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims." *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (en banc), *aff 'd*, U.S. , 116 S. Ct. 1384 (1996).

"First, there must be some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must

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be a **reasonable expectation of success**. Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc., Garlock, Inc.*, 721 F.2d, 1540, 220 USPQ 303 (Fed Cir. 1983), cert denied, 469 U.S. 851 (1984).

Conclusion

The cited references, either individually or in combination, do not produce or suggest Applicants invention, and are therefore insufficient to make out a *prima facie* case of obviousness with respect to both Applicants independent and dependent claims.

The Claims have been amended to further clarify Applicants invention. A favorable consideration of Applicants' claims is

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respectfully requested.

Based on the foregoing, Applicants respectfully submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention as claimed is not in condition for allowance for any reason, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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